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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/876,567	06/07/2001	William R. Dudley	55806USA1A.002	7795
32692	7590	09/13/2005	EXAMINER	
3M INNOVATIVE PROPERTIES COMPANY PO BOX 33427 ST. PAUL, MN 55133-3427			CREPEAU, JONATHAN	
			ART UNIT	PAPER NUMBER
			1746	
DATE MAILED: 09/13/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/876,567

Applicant(s)

DUDLEY ET AL.

Examiner

Jonathan S. Crepeau

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 06 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-24, 47-51 and 57-59 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 47-51 and 59 is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-24, 57 and 58 is/are rejected.
- 7) ☒ Claim(s) 6 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Amendment***

1. This Office action addresses claims 1-25, 47-51, and 57-59 after entry of the amendments filed on August 24, 2005 and September 6, 2005. Claims 1-5, 7-24, 57, and 58 are newly rejected under 35 USC 102 and 103, but these rejections were not necessitated by amendment. Claims 47-51 and 59 are allowed and claim 6 contains allowable subject matter. As such, prosecution is reopened and this action is non-final.

### ***Claim Rejections - 35 USC § 102***

2. Claims 1, 5, 7-9, 16-24, and 57 are rejected under 35 U.S.C. 102(e) as being anticipated by Carlson (U.S. Patent 6,488,721). The reference teaches a battery component (38, 39) comprising an anode (710), a separator (102), a cathode (201), an edge material (301) contacting an edge of the cathode, and a cathode current collector (401) (see Fig. 10, col. 32, line 15 et seq.). Regarding claim 1, a substrate (2) is coated with a separator material (102), followed by an edge material (301) and a cathode material (201), thereby “improving” the thickness profile of the cathode (see Fig. 6). The separator thus functions as a substrate to the cathode material and is in direct contact therewith. The separator is made of an inorganic xerogel or an organic polymer material (see col. 12, line 60). Consequently, it is submitted that the separator is capable of functioning as a “release liner” as recited in claim 1. Regarding claim 5, the edge material acts

as a physical boundary. Regarding claims 23 and 24, the cathode and edge layers may be solvent coated (see col. 27, line 10). Regarding claim 16, the cathode material edge is approximately square and has a uniform thickness profile and a width of less than 200 microns (see col. 18, line 2; Fig. 5). Regarding claims 17, 18, 21, and 22, the cathode and edge layers may be extrusion coated (see col. 27, line 15). Regarding claim 17, the cathode material layer may be calendered (see col. 17, line 57). Regarding claim 19, the edge material may comprise an electrically insulating thermoplastic polymer such as an ethylene, propylene, or urethane (see col. 25, line 10). Regarding claim 20, the cathode material comprises an electrode active material, an electrically conductive material, and an ionically conductive material (e.g., ionically conducting polymer, electrolyte salt) (see col. 17, line 60; col. 29, line 43 et seq.). Regarding claim 7, the cathode material and the edge material are “immiscible” because distinct layers are formed upon coating. Regarding claim 8, the shape of the cathode edge is inherently altered by the presence of the edge material. Regarding claim 9, the cathode thickness is in the range of 5 to 200 microns (e.g., 100 microns), which anticipates the ranges of bulk and edge cathode thicknesses. The separator layer in contact with the cathode may comprise a solid polymer electrolyte (see col. 29, line 43).

Thus, the instant claims are anticipated.

3. Claims 2-4, 10-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carlson in view of Liu et al (U.S. Patent 6,159,544).

Carlson is applied to claims 1, 5, 7-9, 16-24, and 57 for the reasons stated above.

However, Carlson does not teach that the cathode and edge layers are coated substantially simultaneously by a die coater having at least two slots, as recited in claims 4, 10, and 13.

Liu et al. is directed to a die coater having multiple substantially parallel slots for coating adjacent layers of different material on a substrate (see abstract; Fig. 1). Shims are arranged in the slots to form the stripes (see col. 4, lines 40-46).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to use the die coater of Liu et al. to form the cathode and edge layers of Carlson. In column 2, line 32, Liu et al. teach that the disadvantages of the prior art include “non-uniform width of stripes” and “ambiguous interfaces of coating solutions.” Further, in column 2, line 43, the reference teaches that an object of the invention is to provide “distinct interfaces” between stripes. Accordingly, this would provide the artisan sufficient motivation to use the die coater of Liu et al. to form the cathode assembly of Carlson.

Regarding the ranges of separation distance and substrate speed recited in claims 11 and 12, , these ranges are not considered to distinguish over the references. A small (e.g., <5 mm) separation between slots would be necessary to obtain the touching stripes disclosed by Liu et al. Additionally, the substrate speed may be adjusted by a skilled artisan depending on the viscosity of the coating mixtures and desired thickness of the coatings.

Regarding claims 2 and 3, which recite that the coated cathode material comprises a tapered edge, this limitation is also not considered to distinguish over the references. Although

the drawings of Carlson schematically show a square-shaped cathode material coating edge, in actual practice this edge would be likely to have a slight taper (i.e., the edge would not be 90 degrees in relation to the substrate). Furthermore, it has generally been held that a change in shape is not sufficient to distinguish over the prior art unless a new or unexpected result is shown. See MPEP §2144.04 (IV).

4. Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Carlson (U.S. Patent 6,488,721) in view of Hommura et al (U.S. Patent 6,458,490).

Carlson is applied to claim 1 for the reasons stated in section 2 above. However, Carlson does not expressly teach that the separator (i.e., the claimed “substrate”) is made of paper, as recited in claim 1.

Hommura et al. is directed to a nonaqueous secondary battery comprising a paper separator (see abstract).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to use the paper separator of Hommura et al. as the separator of Carlson. In column 2, line 61, Hommura et al. teach the following:

Paper can be manufactured without any complicated manufacturing process required for a small-pore polyolefin film. Moreover, paper exhibits excellent heat resistance. When the thickness and the permeability of paper are properly determined, characteristics of the battery required in a case of a high load can be maintained. Moreover, unintentional short circuit can be prevented.

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As such, the artisan would be motivated to use the paper separator of Hommura et al. as the separator of Carlson.

5. Claim 58 is rejected under 35 U.S.C. 103(a) as being unpatentable over Carlson in view of Yamaguchi et al (U.S. Pre-Grant Publication No. 2002/0037458).

Carlson is applied to claims 1, 5, 7-9, 16-24, and 57 for the reasons stated above.

Further, the reference teaches in column 29, line 43 that the solid electrolyte may comprise polyethylene oxide, polypropylene oxide, and polyacrylonitrile, among other materials.

However, the reference does not expressly teach that the separator/solid electrolyte (i.e., the release liner) comprises silicone as recited in claim 58.

Yamaguchi et al. is directed to a nonaqueous electrolyte battery. In paragraph 0079, the reference teaches a solid polymer electrolyte that may contain silicone, acrylonitrile, polyethylene oxide, or polypropylene oxide, among other materials.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the disclosure of Yamaguchi indicates that silicone is functionally equivalent to polyethylene oxide, polypropylene oxide, and polyacrylonitrile when used as a solid electrolyte material. As such, the artisan would be sufficiently skilled to use the silicone of Yamaguchi as the electrolyte of Carlson et al. An express suggestion to substitute one equivalent component or process for another is not

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necessary to render such substitution obvious. *In re Fout*, 675 F.2d 297, 213 USPQ 532 (CCPA 1982); MPEP §2144.06.

***Allowable Subject Matter***

6. Claims 47-51 and 59 are allowed.
7. Claim 6 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

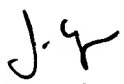
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr, can be reached at (571) 272-1414. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished



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Jonathan Crepeau  
Primary Examiner  
Art Unit 1746  
September 9, 2005